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NAS WHITING FIELD
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RESULTS OF ADDITIONAL SOIL SAMPLING AT SITE 15 NAS WHITING FIELD FL
2/13/2002
CH2M HILL

Results of Additional Soil Sampling at Site 15

PREPARED FOR: NAS Pensacola Partnering Team

PREPARED BY: Amy Twitty, P.G.

DATE: February 13, 2002

Background

Site 15 (Operable Unit 4) is located in the northern portion of NAS Pensacola, as shown on Figure 1, and is surrounded by the golf course on its southern and western sides and Bayou Grande approximately 600 feet to the north. The site, which includes the golf course maintenance facilities, is accessible from the west by an unpaved road and consists of portions of the golf course, maintenance buildings, equipment storage buildings, and concrete wash-down areas.

From 1963 to the present, fertilizer, pesticide, and herbicide materials for application at the golf course have been stored and mixed at the golf course maintenance facility. Application equipment is also rinsed at the facility's wash-down pads. Past practices have resulted in the release of contaminants at the site. During remedial investigation activities, 11 areas of soil contamination were identified. Arsenic, dieldrin and benzo(a)pyrene equivalents (BEQs) were identified as contaminants of concern (COCs). Figure 2 presents the site layout and identifies the 11 areas as well as sample locations from previous investigation activities.

Remediation activities at Site 15 are regulated under the authority of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA). The Record of Decision (ROD) (EnSafe, Inc., 1999) for the site requires the removal of contaminated soil above the industrial goals to eliminate dermal and ingestion risk pathways and the monitoring of groundwater to ensure the COCs are not migrating offsite.

Soil Investigation

As stated in the ROD, where contamination was not completely delineated, remedial soil volumes were calculated based on a sample-point basis to a depth of 2 feet below land surface (bls) and a 10-foot radius. Since excavation activities will continue until the remedial goals are met for arsenic, dieldrin and BEQs, surface and subsurface soil samples were collected for delineation prior to excavation activities to avoid leaving the excavation open for prolonged periods and to facilitate accurate quantification of soil. Arsenic was identified as a COC in all 11 areas of investigation. Dieldrin was identified above action levels only in Area 8 and BEQs were identified only in Area 11.

The soil sampling began by collecting a minimum of five samples per hot spot area (more on the larger areas); one surface sample from each side at the proposed excavation limits and one subsurface sample at the surveyed-in original sample point at intervals of 2 to 3 feet

bls. If the analytical data indicated the remedial goals were achieved, no further sampling was conducted. If remedial goals were not achieved, then additional sample(s) were collected 5 feet outward from the previous sample(s). This sampling pattern was proposed to continue until the remediation cleanup goals were reached. If the vertical delineation sample results exceed subsurface soil criteria, additional samples were collected at 5-foot intervals, beginning from 5 to 6 feet bls until clean soil was found or until the groundwater table was reached, whichever occurred first.

From August 24 through December 6, 2001, a total of 148 native surface soil samples, 29 subsurface samples, and associated Quality Assurance/Quality Control (QA/QC) samples were collected by CH2M HILL Constructors, Inc. (CCI) in the vicinity of the identified remedial areas for the source delineation of arsenic, dieldrin and BEQs. Figure 3 presents the sample locations for Areas 1, 2, and 3; Figure 4 presents the sample locations for Areas 4 and 5; Figure 5 presents the sample locations for Areas 6 and 7; Figure 6 presents the sample locations for Areas 8 and 9; and Figure 7 presents the sample locations for Areas 10 and 11. The surface soil samples were taken from 0 to 2 feet bls and analyzed for the specified COCs for that area. The determination of whether to continue collecting samples was based on the analytical results of the initial samples.

Shallow soil samples were collected using decontaminated stainless steel hand augers. The deeper samples were collected using a drill rig equipped for direct-push technology. Soil was placed into stainless steel bowls, thoroughly mixed using stainless steel spoons, and placed in glass jars. All sampling was conducted in accordance with CCI's Basewide Work Plan for NAS Pensacola (CCI, 1999), Florida Department of Environmental Protection (FDEP) Standard Operating Procedures and the U.S. Environmental Protection Agency (EPA), Region IV Environmental Investigation Standard Operating Procedures and Quality Assurance Manual (EISOPQAM) dated May 1996, revised 1997.

All samples were delivered to Severn Trent Laboratories in Pensacola, Florida (a Navy-approved laboratory). Select samples were analyzed for total arsenic using EPA Method 6010B, dieldrin using EPA Method 8081A and polynuclear aromatic hydrocarbons (PAHs) for the identification of BEQs using EPA Method 8310.

Results

As listed in the ROD, remediation cleanup goals for surface soil are 3.7 milligrams per kilogram (mg/kg) for arsenic, 300 micrograms per kilogram ($\mu\text{g}/\text{kg}$) for dieldrin and 500 $\mu\text{g}/\text{kg}$ for BEQs. The remediation cleanup goals for subsurface soil are 29 mg/kg for arsenic, 4 $\mu\text{g}/\text{kg}$ for dieldrin, and 8,000 $\mu\text{g}/\text{kg}$ for BEQs. Analytical results were compared to the cleanup goals established in the ROD. Table 1 presents a summary of the surface soil results. Table 2 presents a summary of the subsurface soil results. The analytical report is included in Appendix A. The Data Quality Evaluation (DQE) performed for the analytical results is presented in Appendix B.

Arsenic

Of the 128 surface soil samples analyzed for arsenic (including duplicates) through October 2001, 86 samples exhibited concentrations above the established cleanup goal of 3.7 mg/kg. The sampling team remobilized twice from August through October after the initial soil

samples were collected in an effort to delineate the 11 hot spots. After the three sampling events, only one of the hot spot areas (Area 10) had been fully delineated. The highest arsenic concentration through October was 440 mg/kg. Using the entire data set, the mean concentration was 13.7 mg/kg and the median was 5.4 mg/kg.

Arsenic is known to be naturally occurring in the northwest Florida area as documented in a background study conducted for NAS Whiting Field in northern Santa Rosa County (Odenthal, 2001). Many sites at NAS Whiting Field had concentrations of arsenic above the FDEP cleanup criteria but most of these sites had no documented use of arsenic.

NAS Whiting Field collected a background data set from the Navy's outlying fields in northwest Florida (Pace Field, Spencer Field, Santa Rosa Field, and Harold Field). Arsenic concentrations in this background, offsite data set ranged from 0 to 12 mg/kg. The study concluded arsenic concentrations in areas with no known contamination are comparable to the sites at NAS Whiting having no known arsenic sources. In a letter dated April 11, 2001, FDEP noted the arsenic concentrations at NAS Whiting Field are within the range of naturally occurring concentrations at outlying fields. Although it is specific for NAS Whiting Field, a copy of this letter is included in Appendix C.

The pesticides used in the golf course maintenance area at Site 15 were known to contain arsenic; however, many of the arsenic concentrations around the golf course itself are consistent with background concentrations as described above.

In addition to examining background concentrations, CCI also performed statistical analyses on the surface soil concentrations at Site 15 by establishing a 95 percent upper confidence level (UCL). This UCL was established based on the results of the surface soil samples collected from August through October 2001 (Table 1). The concentrations of arsenic to which human receptors will be exposed to over time were estimated in order to determine a 95 percent UCL on the mean of arsenic concentrations. Inherent in this approach is the assumption that an individual's contact with the contaminated area is random. The best representation of the concentration to which he/she is exposed is the average contaminant concentration over that area. Thus, an estimate of average concentration represents the concentration to which an individual might be exposed. Because it provides a conservative estimate of exposure point concentration over time, the 95 percent UCL of the mean concentration is generally the most appropriate basis for comparing site contaminant concentrations with cleanup values. The bootstrap method was used to calculate the UCLs. This method is a probabilistic UCL employing Monte Carlo simulation methods on the available sample data (EPA, 1997; Efron, 1993). As such it does not require an a priori distributional assumption. Instead, it creates a distribution of the parameter of interest based on a large number of resamples of the available data. For the UCLs presented in the table below, 1,000 resamples were evaluated. As a general rule, an upper limit for contaminant concentrations in hot spots of three times the UCL should be health protective.

A statistical analysis of the surface soil sample results collected from the August through October 2001 sampling events was used to determine the 95 percent UCL. Several arsenic concentrations were outside the range considered as "background." The table below demonstrates the change in the UCL when these "outliers" are removed. All outliers would be considered true areas of arsenic contamination and it is assumed they will be remediated.

95 Percent UCL for Arsenic concentrations
 Site 15, NAS Pensacola

| | Maximum Result (mg/kg) | 95% UCL (mg/kg) | 3 times 95% UCL (mg/kg) |
|-------------------------------------|-----------------------------------|----------------------------|------------------------------------|
| All Results | 440 | 33.7 | 101.1 |
| Elevated Value of 440 mg/kg removed | 83 | 12.4 | 37.2 |
| Elevated Values > 83 mg/kg removed | 65 | 11.3 | 37.2 |
| Elevated Values > 62 mg/kg removed | 42 | 9.8 | 29.4 |
| Elevated Values > 40 mg/kg removed | 34 | 9.0 | 27 |
| Elevated Values > 24 mg/kg removed | 22 | 7.0 | 21 |
| Elevated Values > 15 mg/kg removed | 14 | 5.8 | 17.4 |

By eliminating all values greater than 15 mg/kg, the 95 percent UCL is calculated as 5.8 mg/kg, with 3 times the 95 percent UCL as 17.4 mg/kg. Using 17.4 mg/kg as the cleanup value, Areas 1, 2, 3, and 4 on the golf course, Area 5 south of the golf course road, and Area 10 approximately 50 feet south of Building 3596 could be eliminated. Only Areas 6, 7, 8, 9, and 11, which are located immediately in the vicinity of pesticide mixing activities, would require remediation.

CCI presented the preliminary data to the NAS Pensacola Partnering Team through a series of memos and at the Partnering Team conference calls on October 29, November 1 and 16, 2001. Both EPA and FDEP representatives (with consensus from their management) approved the concept of using the 95% UCL and accepted 17.4 mg/kg as the new target cleanup value for arsenic in surface soil at Site 15.

CCI remobilized to Site 15 in an effort to delineate arsenic in surface soil to 17.4 mg/kg. Figure 8 presents the arsenic results in surface soil around Areas 6 and 7, Figure 9 presents the arsenic results in surface soil around areas 8 and 9, and Figure 10 presents the arsenic results in surface soil around Areas 10 and 11. Arsenic concentrations in surface soil exceeded the new cleanup value in 33 locations. Arsenic concentrations in the subsurface soil were all below the cleanup value of 29 mg/kg.

Dieldrin

Dieldrin was analyzed in samples from Area 8 only. A total of 19 surface soil samples (including four duplicate samples) and 15 subsurface samples (including two duplicates) were analyzed for dieldrin. Dieldrin concentrations in three surface soil samples collected from 0 to 2 feet bls and five subsurface soil samples collected in three locations (two areas from 2 to 3 feet only, one area from 2 to 3, 3 to 4 and 7 to 8 feet bls) exceeded the cleanup criteria in Area 8. Figure 11 presents the dieldrin exceedances in Area 8.

BEQs

No BEQ concentrations were above the cleanup goals.

Conclusions and Recommendations

Surface soil was delineated for arsenic using 3 times the 95 percent UCL (17.4 mg/kg). Additionally, arsenic concentrations on the golf course and in areas not associated with the maintenance buildings are consistent with background concentrations and may not be the result of activities at the site. Arsenic concentrations in surface soil exceeded the new cleanup value in 33 locations.

Dieldrin concentrations in three surface soil samples collected from 0 to 2 feet bls and five subsurface soil samples collected in three locations exceeded the cleanup criteria in Area 8.

No BEQ concentrations above the cleanup goals were detected; therefore, no further sampling for BEQs is necessary.

Based on the arsenic and dieldrin concentrations found at Site 15, five excavation areas are proposed, totaling approximately 754 cubic yards. Areas 6, 7, 8, 9 and 11. The following table presents the proposed volumes of soil associated with these excavations. Figure 12 presents the locations of the proposed excavation areas. CCI will work with facility personnel to be protective of trees and only remove trees that are necessary to facilitate excavation and that are approved by the base.

Proposed Excavation Volumes
Site 15, NAS Pensacola

| Excavation Area | Depth | Volume (cubic yards) |
|-------------------|-------|----------------------|
| 6 | 0-2 | 57 |
| 7 | 0-2 | 90 |
| 8 and 9 | 0-2 | 314 |
| 8 | 0-10 | 232 |
| 9 | 0-10 | 17 |
| 11 | 0-2 | 44 |
| Total Cubic Yards | | 754 |

Works Cited

CH2M HILL Constructors, Inc. June 2000. Basewide Work Plan Naval Air Station Pensacola, Pensacola, Florida.

CH2M HILL Constructors, Inc. July 1998. Contract Management Plan, Contract No. N62467-98-D-0995.

Efron, B. and Tibshirani, R.J. 1993. An Introduction to the Bootstrap. Chapman and Hall/CRC, Boca Raton, Florida.

EnSafe, Inc. November 1999. Final Record of Decision, Operable Unit 4, NAS Pensacola, Pensacola, Florida.

Odenthal, LCDR Paul. February 2001. NAS Whiting Field PWO, *The Palmer Brief*.

U.S. Environmental Protection Agency. 1997. *The Lognormal Distribution in Environmental Applications*. Office of Research and Development, Environmental Protection Agency.

This Data Transfer Memorandum for Site 15 at Naval Air Station Pensacola was prepared under the direction of a Registered Professional Geologist.

Amy T. Twitty, P.G. No. 1703

Date

Tables

Table 1
Surface Soil Analytical Results
Site 15, NAS Pensacola

| Compounds | Regulatory Guidance Surface Soil (3x 95% UCL) | 15SS71 (0-2') | 15SS72 (0-2') | 15SS73 (0-2') | 15SS74 (0-2') | 15SS76 (0-2') | 15SS77 (0-2') | 15SS78 (0-2') | 15SS79 (0-2') | 15SS81 (0-2') | 15SS82 (0-2') | 15SS145 Dupe of 15SS82 (0-2') | 15SS83 (0-2') | 15SS84 (0-2') | 15SS86 (0-2') | 15SS87 (0-2') | 15SS88 (0-2') | 15SS89 (0-2') | 15SS91 (0-2') |
|---------------------------------------|---|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|-------------------------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|
| PAHs (ug/kg) | | | | | | | | | | | | | | | | | | | |
| Acenaphthene | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | |
| Acenaphthylene | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | |
| Anthracene | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | |
| Benzo(a)anthracene | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | |
| Benzo(a)pyrene | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | |
| Benzo(b)flouranthene | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | |
| Benzo(g,h,i)perylene | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | |
| Benzo(k)fluoranthene | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | |
| Chrysene | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | |
| Dibenz(a,h)anthracene | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | |
| Fluoranthene | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | |
| Fluorene | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | |
| Indeno(1,2,3-cd)pyrene | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | |
| Naphthalene | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | |
| Phenanthrene | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | |
| Pyrene | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | |
| 1-Methylnaphthalene | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | |
| 2-Methylnaphthalene | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | |
| BEQs | | | | | | | | | | | | | | | | | | | |
| Benzo(a)Anthracene | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | |
| Chrysene | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | |
| Benzo(b)Fluoranthene | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | |
| Benzo(k)Fluoranthene | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | |
| Benzo(a)Pyrene | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | |
| Indeno(1,2,3-c,d)pyrene | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | |
| Dibenz(a,h)anthracene | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | |
| Total | 500 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | |
| Metals (mg/kg) | | | | | | | | | | | | | | | | | | | |
| Arsenic | 17.4 | 5.5 | 3.9 | 4.4 | 1.9 | 2.4 | 4.7 | 1.7 | 2.8 | 3.0 | 8.4 | 11 | 5.7 | 6.6 | 5.8 | 3.1 | 0.98 | 5.4 | 2.6 |
| Chlorinated Pesticides (ug/kg) | | | | | | | | | | | | | | | | | | | |
| Dieldrin | 300 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | |

Notes:

Soil concentrations exceeding regulatory guidelines are **BOLD**.

PAH = Polynuclear Aromatic Hydrocarbons

-- = Not Analyzed

mg/kg = milligrams per kilogram

ug/kg = micrograms per kilogram

J = estimated value

D = Sample was diluted prior to being analyzed

U = Undetected

^a First Duplicate sample numbered 15SS150-S-02

^b Second Duplicate sample numbered 15SS150-S-02

Table 1
Surface Soil Analytical Results
Site 15, NAS Pensacola

| Compounds | Regulatory Guidance Surface Soil (3x 95% UCL) | 15SS147 Dupe of 15SS91 (0-2') | 15SS92 (0-2') | 15SS93 (0-2') | 15SS94 (0-2') | 15SS96 (0-2') | 15SS97 (0-2') | 15SS98 (0-2') | 15SS99 (0-2') | 15SS100 (0-2') | 15SS101 (0-2') | 15SS148 Dupe of 15SS101 (0-2') | 15SS102 (0-2') | 15SS105 (0-2') | 15SS106 (0-2') | 15SS107 (0-2') | 15SS150 ^a Dupe of 15SS107 (0-2') | 15SS108 (0-2') | 15SS109 (0-2') |
|---------------------------------------|---|-------------------------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|----------------|----------------|--------------------------------|----------------|----------------|----------------|----------------|---|----------------|----------------|
| PAHs (ug/kg) | | | | | | | | | | | | | | | | | | | |
| Acenaphthene | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | |
| Acenaphthylene | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | |
| Anthracene | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | |
| Benzo(a)anthracene | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | |
| Benzo(a)pyrene | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | |
| Benzo(b)flouranthene | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | |
| Benzo(g,h,i)perylene | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | |
| Benzo(k)fluoranthene | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | |
| Chrysene | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | |
| Dibenz(a,h)anthracene | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | |
| Fluoranthene | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | |
| Fluorene | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | |
| Indeno(1,2,3-cd)pyrene | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | |
| Naphthalene | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | |
| Phenanthrene | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | |
| Pyrene | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | |
| 1-Methylnaphthalene | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | |
| 2-Methylnaphthalene | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | |
| BEQs | | | | | | | | | | | | | | | | | | | |
| Benzo(a)Anthracene | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | |
| Chrysene | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | |
| Benzo(b)Fluoranthene | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | |
| Benzo(k)Fluoranthene | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | |
| Benzo(a)Pyrene | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | |
| Indeno(1,2,3-c,d)pyrene | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | |
| Dibenz(a,h)anthracene | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | |
| Total | 500 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | |
| Metals (mg/kg) | | | | | | | | | | | | | | | | | | | |
| Arsenic | 17.4 | 2.4 | 3.1 | 2.6 | 6.9 | 2.4 | 14 | 5.7 | 24 | 34 | 2.2 | 4.3 | 65 | 5.9 | 440 | 22 | 29 | 4.5 | 15 |
| Chlorinated Pesticides (ug/kg) | | | | | | | | | | | | | | | | | | | |
| Dieldrin | 300 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 30 | 25 | 78 D | 26 |

Notes:

Soil concentrations exceeding regulatory guidelines are **BOLD**

PAH = Polynuclear Aromatic Hydrocarbons

-- = Not Analyzed

mg/kg = milligrams per kilogram

ug/kg = micrograms per kilogram

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^a First Duplicate sample numbered 15SS150-S-02

^b Second Duplicate sample numbered 15SS150-S-02

Table 1
Surface Soil Analytical Results
Site 15, NAS Pensacola

| Compounds | Regulatory Guidance Surface Soil (3x 95% UCL) | 15SS110 (0-2') | 15SS111 (0-2') | 15SS114 (0-2') | 15SS116 (0-2') | 15SS117 (0-2') | 15SS118 (0-2') | 15SS120 (0-2') | 15SS121 (0-2') | 15SS122 (0-2') | 15SS124 (0-2') | 15SS125 (0-2') | 15SS127 (0-2') | 15SS128 (0-2') | 15SS130 (0-2') | 15SS131 (0-2') | 15SS132 (0-2') | 15SS133 (0-2') | 15SS134 (0-2') |
|---------------------------------------|---|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|
| | PAHs (ug/kg) | | | | | | | | | | | | | | | | | | |
| Acenaphthene | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 88 |
| Acenaphthylene | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 11 U |
| Anthracene | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 11 U |
| Benzo(a)anthracene | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 23 |
| Benzo(a)pyrene | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 58 |
| Benzo(b)flouranthene | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 35 J |
| Benzo(g,h,i)perylene | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 27 J |
| Benzo(k)fluoranthene | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 18 J |
| Chrysene | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 44 J |
| Dibenz(a,h)anthracene | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 15 J |
| Fluoranthene | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 60 J |
| Fluorene | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 11 U |
| Indeno(1,2,3-cd)pyrene | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 24 J |
| Naphthalene | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 11 U |
| Phenanthrene | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 19 |
| Pyrene | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 47 |
| 1-Methylnaphthalene | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 11 U |
| 2-Methylnaphthalene | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 25 J |
| BEQs | | | | | | | | | | | | | | | | | | | |
| Benzo(a)Anthracene | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 2.3 |
| Chrysene | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 0.044 J |
| Benzo(b)Fluoranthene | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 3.5 J |
| Benzo(k)Fluoranthene | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 0.18 J |
| Benzo(a)Pyrene | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 58 |
| Indeno(1,2,3-c,d)pyrene | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 2.4 J |
| Dibenz(a,h)anthracene | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 15 J |
| Total | 500 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 81.4 |
| Metals (mg/kg) | | | | | | | | | | | | | | | | | | | |
| Arsenic | 17.4 | 6.3 | 20 | 14 | 15 | 14 | 2.7 | 2.9 | 5.7 | 3.3 | 3.4 | 15 | 21 | 3.9 | 1.5 | 1.7 | 2.3 | 2.2 | 3.2 |
| Chlorinated Pesticides (ug/kg) | | | | | | | | | | | | | | | | | | | |
| Dieldrin | 300 | 750 D | 20 | 350 D | 68 | 41 | 1.8 U | 37 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |

Notes:

Soil concentrations exceeding regulatory guidelines are **BOLD**

PAH = Polynuclear Aromatic Hydrocarbons

-- = Not Analyzed

mg/kg = milligrams per kilogram

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J = estimated value

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^a First Duplicate sample numbered 15SS150-S-02

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Table 1
Surface Soil Analytical Results
Site 15, NAS Pensacola

| Compounds | Regulatory Guidance Surface Soil (3x 95% UCL) | 15SS152 Dupe of 15SS134 (0'-2') | 15SS137 (0'-2') | 15SS138 (0'-2') | 15SS139 (0'-2') | 15SS140 (0'-2') | 15SS150 ^b Dupe of 15SS140 (0'-2') | 15SS142 (0'-2') | 15SS143 (0'-2') | 15SS144 (0'-2') | 15SS200 (0'-2') | 15SS232 Dupe of 15SS200 (0'-2') | 15SS201 (0'-2') | 15SS202 (0'-2') | 15SS203 (0'-2') | 15SS204 (0'-2') | 15SS205 (0'-2') | 15SS206 (0'-2') |
|---------------------------------------|---|---------------------------------|-----------------|-----------------|-----------------|-----------------|--|-----------------|-----------------|-----------------|-----------------|---------------------------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|
| PAHs (ug/kg) | | | | | | | | | | | | | | | | | | |
| Acenaphthene | | 46 | 95 | 350 J | 170 | 290 J | -- | 110 | 45 | 55 | -- | -- | -- | -- | -- | -- | -- | -- |
| Acenaphthylene | | 10 U | 11 U | 11 U | 11 U | 11 U | -- | 11 U | 10 U | 11 U | -- | -- | -- | -- | -- | -- | -- | |
| Anthracene | | 10 U | 11 U | 11 U | 11 U | 11 U | -- | 11 U | 10 U | 11 U | -- | -- | -- | -- | -- | -- | -- | |
| Benzo(a)anthracene | | 9.8 J | 24 | 86 | 31 | 74 | -- | 27 | 11 | 12 | -- | -- | -- | -- | -- | -- | -- | |
| Benzo(a)pyrene | | 42 J | 65 | 150 J | 75 | 160 J | -- | 79 | 43 J | 48 | -- | -- | -- | -- | -- | -- | -- | |
| Benzo(b)flouranthene | | 20 J | 42 J | 120 J | 59 J | 130 J | -- | 55 J | 23 J | 29 J | -- | -- | -- | -- | -- | -- | -- | |
| Benzo(g,h,i)perylene | | 21 J | 33 J | 80 J | 58 J | 130 J | -- | 47 J | 17 J | 25 J | -- | -- | -- | -- | -- | -- | -- | |
| Benzo(k)fluoranthene | | 9.5 J | 20 J | 60 J | 28 J | 62 J | -- | 25 J | 10 J | 14 J | -- | -- | -- | -- | -- | -- | -- | |
| Chrysene | | 30 J | 67 J | 120 | 62 J | 82 | -- | 60 J | 23 J | 52 J | -- | -- | -- | -- | -- | -- | -- | |
| Dibenz(a,h)anthracene | | 10 U | 20 J | 44 J | 48 J | 74 J | -- | 29 J | 10 U | 14 J | -- | -- | -- | -- | -- | -- | -- | |
| Fluoranthene | | 29 J | 47 J | 220 J | 82 J | 150 J | -- | 56 J | 28 J | 41 J | -- | -- | -- | -- | -- | -- | -- | |
| Fluorene | | 10 U | 11 U | 11 U | 11 U | 11 U | -- | 11 U | 10 U | 11 U | -- | -- | -- | -- | -- | -- | -- | |
| Indeno(1,2,3-cd)pyrene | | 20 J | 29 J | 73 J | 40 J | 100 J | -- | 40 J | 15 J | 21 J | -- | -- | -- | -- | -- | -- | -- | |
| Naphthalene | | 10 U | 11 U | 11 U | 12 J | 11 U | -- | 11 U | 13 | 11 U | -- | -- | -- | -- | -- | -- | -- | |
| Phenanthrene | | 7.9 J | 13 | 74 | 16 | 37 | -- | 14 | 7.1 J | 9.4 J | -- | -- | -- | -- | -- | -- | -- | |
| Pyrene | | 23 | 45 | 180 | 51 | 120 | -- | 49 | 21 | 27 | -- | -- | -- | -- | -- | -- | -- | |
| 1-Methylnaphthalene | | 10 U | 11 U | 11 U | 11 U | 11 U | -- | 11 U | 10 U | 11 U | -- | -- | -- | -- | -- | -- | -- | |
| 2-Methylnaphthalene | | 15 J | 29 J | 100 J | 36 J | 83 J | -- | 34 J | 14 J | 15 J | -- | -- | -- | -- | -- | -- | -- | |
| BEQs | | | | | | | | | | | | | | | | | | |
| Benzo(a)Anthracene | | 0.98 | 2.4 | 8.6 | 3.1 | 7.4 | -- | 2.7 | 1.1 | 1.2 | -- | -- | -- | -- | -- | -- | -- | |
| Chrysene | | 0.03 J | 0.067 J | 0.12 | 0.062 J | 0.082 | -- | 0.06 J | 0.023 J | 0.052 J | -- | -- | -- | -- | -- | -- | -- | |
| Benzo(b)Fluoranthene | | 2 J | 4.2 J | 12 J | 5.9 J | 13 J | -- | 5.5 J | 2.3 J | 2.9 J | -- | -- | -- | -- | -- | -- | -- | |
| Benzo(k)Fluoranthene | | 0.095 J | 0.2 J | 0.6 J | 0.28 J | 0.62 J | -- | 0.25 J | 0.1 J | 0.14 J | -- | -- | -- | -- | -- | -- | -- | |
| Benzo(a)Pyrene | | 42 | 65 | 150 J | 75 | 160 J | -- | 79 | 43 J | 48 | -- | -- | -- | -- | -- | -- | -- | |
| Indeno(1,2,3-c,d)pyrene | | 2 J | 2.9 J | 7.3 J | 4 J | 10 J | -- | 4 J | 1.5 J | 2.1 J | -- | -- | -- | -- | -- | -- | -- | |
| Dibenz(a,h)anthracene | | 5 U | 20 J | 44 J | 48 J | 74 J | -- | 29 J | 5 U | 14 J | -- | -- | -- | -- | -- | -- | -- | |
| Total | 500 | 52.1 | 94.8 | 222.6 | 136.3 | 265.1 | -- | 120.5 | 53.0 | 68.4 | -- | -- | -- | -- | -- | -- | -- | |
| Metals (mg/kg) | | | | | | | | | | | | | | | | | | |
| Arsenic | 17.4 | 3.1 | 3.7 | 4.4 | 13 | 5.0 | 4.7 | 5.1 | 3.2 | 3.8 | 7.2 | 8.1 | 5.4 | 13 | 6.4 | 4.3 | 34 | 5.3 |
| Chlorinated Pesticides (ug/kg) | | | | | | | | | | | | | | | | | | |
| Dieldrin | 300 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 890 | -- |

Notes:

Soil concentrations exceeding regulatory guidelines are **BOLD**

PAH = Polynuclear Aromatic Hydrocarbons

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mg/kg = milligrams per kilogram

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D = Sample was diluted prior to being analyzed

U = Undetected

^a First Duplicate sample numbered 15SS150-S-02

^b Second Duplicate sample numbered 15SS150-S-02

Table 1
Surface Soil Analytical Results
Site 15, NAS Pensacola

| Compounds | Regulatory Guidance Surface Soil (3x 95% UCL) | 15SS207 (0-2') | 15SS208 (0-2') | 15SS209 (0-2') | 15SS233 Dupe of 15SS209 (0-2') | 15SS210 (0-2') | 15SS211 (0-2') | 15SS212 (0-2') | 15SS213 (0-2') | 15SS214 (0-2') | 15SS215 (0-2') | 15SS216 (0-2') | 15SS217 (0-2') | 15SS218 (0-2') | 15SS219 (0-2') | 15SS220 (0-2') | 15SS221 (0-2') | 15SS222 (0-2') | 15SS223 (0-2') |
|---------------------------------------|---|----------------|----------------|----------------|--------------------------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|
| PAHs (ug/kg) | | | | | | | | | | | | | | | | | | | |
| Acenaphthene | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | |
| Acenaphthylene | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | |
| Anthracene | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | |
| Benzo(a)anthracene | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | |
| Benzo(a)pyrene | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | |
| Benzo(b)flouranthene | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | |
| Benzo(g,h,i)perylene | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | |
| Benzo(k)fluoranthene | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | |
| Chrysene | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | |
| Dibenz(a,h)anthracene | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | |
| Fluoranthene | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | |
| Fluorene | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | |
| Indeno(1,2,3-cd)pyrene | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | |
| Naphthalene | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | |
| Phenanthrene | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | |
| Pyrene | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | |
| 1-Methylnaphthalene | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | |
| 2-Methylnaphthalene | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | |
| BEQs | | | | | | | | | | | | | | | | | | | |
| Benzo(a)Anthracene | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | |
| Chrysene | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | |
| Benzo(b)Fluoranthene | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | |
| Benzo(k)Fluoranthene | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | |
| Benzo(a)Pyrene | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | |
| Indeno(1,2,3-c,d)pyrene | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | |
| Dibenz(a,h)anthracene | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | |
| Total | 500 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | |
| Metals (mg/kg) | | | | | | | | | | | | | | | | | | | |
| Arsenic | 17.4 | 83 | 14 | 13 | 14 | 20 | 7.1 | 5.7 | 9.8 | 9.7 | 28 | 28 | 2.2 | 3.4 | 5.0 | 12 | 6.4 | 3.1 | 3.8 |
| Chlorinated Pesticides (ug/kg) | | | | | | | | | | | | | | | | | | | |
| Dieldrin | 300 | -- | -- | -- | 52 | 52 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | |

Notes:

Soil concentrations exceeding regulatory guidelines are **BOLD**

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mg/kg = milligrams per kilogram

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J = estimated value

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U = Undetected

^a First Duplicate sample numbered 15SS150-S-02

^b Second Duplicate sample numbered 15SS150-S-02

Table 1
Surface Soil Analytical Results
Site 15, NAS Pensacola

| Compounds | Regulatory Guidance Surface Soil (3x 95% UCL) | 15SS224 (0-2') | 15SS225 (0-2') | 15SS226 (0-2') | 15SS227 (0-2') | 15SS228 (0-2') | 15SS229 (0-2') | 15SS230 (0-2') | 15SS231 (0-2') | 15SS234 Dupe of 15SS231 (0-2') | 15SS250 (0-2') | 15SS251 (0-2') | 15SS282 Dupe of 15SS251 (0-2') | 15SS252 (0-2') | 15SS253 (0-2') | 15SS254 (0-2') | 15SS255 (0-2') | 15SS256 (0-2') | 15SS257 (0-2') |
|---------------------------------------|---|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|--------------------------------|----------------|----------------|--------------------------------|----------------|----------------|----------------|----------------|----------------|----------------|
| PAHs (ug/kg) | | | | | | | | | | | | | | | | | | | |
| Acenaphthene | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | |
| Acenaphthylene | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | |
| Anthracene | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | |
| Benzo(a)anthracene | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | |
| Benzo(a)pyrene | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | |
| Benzo(b)flouranthene | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | |
| Benzo(g,h,i)perylene | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | |
| Benzo(k)fluoranthene | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | |
| Chrysene | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | |
| Dibenz(a,h)anthracene | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | |
| Fluoranthene | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | |
| Fluorene | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | |
| Indeno(1,2,3-cd)pyrene | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | |
| Naphthalene | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | |
| Phenanthrene | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | |
| Pyrene | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | |
| 1-Methylnaphthalene | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | |
| 2-Methylnaphthalene | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | |
| BEQs | | | | | | | | | | | | | | | | | | | |
| Benzo(a)Anthracene | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | |
| Chrysene | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | |
| Benzo(b)Fluoranthene | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | |
| Benzo(k)Fluoranthene | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | |
| Benzo(a)Pyrene | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | |
| Indeno(1,2,3-c,d)pyrene | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | |
| Dibenz(a,h)anthracene | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | |
| Total | 500 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | |
| Metals (mg/kg) | | | | | | | | | | | | | | | | | | | |
| Arsenic | 17.4 | 4.6 | 6.6 | 2.7 | 1.9 | 2.3 | 1.4 | 3.1 | 6.7 | 6.5 | 8 | 62 | 64 | 5.4 | 10 | 10 | 40 | 1.1 | 1.5 |
| Chlorinated Pesticides (ug/kg) | | | | | | | | | | | | | | | | | | | |
| Dieldrin | 300 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 250 | -- | -- |

Notes:

Soil concentrations exceeding regulatory guidelines are **BOLD**

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^b Second Duplicate sample numbered 15SS150-S-02

Table 1
Surface Soil Analytical Results
Site 15, NAS Pensacola

| Compounds | Regulatory Guidance Surface Soil (3x 95% UCL) | 15SS258 (0-2') | 15SS259 (0-2') | 15SS283 Dupe of 15SS259 (0-2') | 15SS260 (0-2') | 15SS261 (0-2') | 15SS262 (0-2') | 15SS263 (0-2') | 15SS264 (0-2') | 15SS265 (0-2') | 15SS266 (0-2') | 15SS267 (0-2') | 15SS268 (0-2') | 15SS269 (0-2') | 15SS270 (0-2') | 15SS271 (0-2') | 15SS272 (0-2') | 15SS273 (0-2') | 15SS274 (0-2') |
|---------------------------------------|---|----------------|----------------|--------------------------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|
| PAHs (ug/kg) | | | | | | | | | | | | | | | | | | | |
| Acenaphthene | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | |
| Acenaphthylene | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | |
| Anthracene | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | |
| Benzo(a)anthracene | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | |
| Benzo(a)pyrene | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | |
| Benzo(b)flouranthene | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | |
| Benzo(g,h,i)perylene | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | |
| Benzo(k)fluoranthene | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | |
| Chrysene | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | |
| Dibenz(a,h)anthracene | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | |
| Fluoranthene | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | |
| Fluorene | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | |
| Indeno(1,2,3-cd)pyrene | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | |
| Naphthalene | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | |
| Phenanthrene | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | |
| Pyrene | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | |
| 1-Methylnaphthalene | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | |
| 2-Methylnaphthalene | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | |
| BEQs | | | | | | | | | | | | | | | | | | | |
| Benzo(a)Anthracene | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | |
| Chrysene | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | |
| Benzo(b)Fluoranthene | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | |
| Benzo(k)Fluoranthene | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | |
| Benzo(a)Pyrene | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | |
| Indeno(1,2,3-c,d)pyrene | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | |
| Dibenz(a,h)anthracene | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | |
| Total | 500 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | |
| Metals (mg/kg) | | | | | | | | | | | | | | | | | | | |
| Arsenic | 17.4 | 1.6 | 42 | 29.0 | 17 | 1.6 | 4.1 | 2.7 | 8.2 | 28 | 30 | 3.3 | 4.2 | 3.0 | 11 | 5.2 | 3.9 | 4.0 | 3.4 |
| Chlorinated Pesticides (ug/kg) | | | | | | | | | | | | | | | | | | | |
| Dieldrin | 300 | -- | 110 | 120 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | |

Notes:

Soil concentrations exceeding regulatory guidelines are **BOLD**

PAH = Polynuclear Aromatic Hydrocarbons

-- = Not Analyzed

mg/kg = milligrams per kilogram

ug/kg = micrograms per kilogram

J = estimated value

D = Sample was diluted prior to being analyzed

U = Undetected

^a First Duplicate sample numbered 15SS150-S-02

^b Second Duplicate sample numbered 15SS150-S-02

Table 1
Surface Soil Analytical Results
Site 15, NAS Pensacola

| Compounds | Regulatory Guidance Surface Soil (3x 95% UCL) | 15SS275 (0-2') | 15SS276 (0-2') | 15SS277 (0-2') | 15SS301 (0-2') | 15SS302 (0-2') | 15SS303 (0-2') | 15SS304 (0-2') | 15SS305 (0-2') | 15SS306 (0-2') | 15SS307 Dup of 15SS301 (0-2') | 15SS310 (0-2') | 15SS311 Dup of 15SS310 (0-2') | 15SS320 (0-2') | 15SS321 (0-2') | 15SS322 (0-2') | 15SS323 (0-2') | 15SS324 (0-2') | 15SS325 (0-2') |
|---------------------------------------|---|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|-------------------------------|----------------|-------------------------------|----------------|----------------|----------------|----------------|----------------|----------------|
| PAHs (ug/kg) | | | | | | | | | | | | | | | | | | | |
| Acenaphthene | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | |
| Acenaphthylene | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | |
| Anthracene | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | |
| Benzo(a)anthracene | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | |
| Benzo(a)pyrene | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | |
| Benzo(b)flouranthene | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | |
| Benzo(g,h,i)perylene | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | |
| Benzo(k)fluoranthene | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | |
| Chrysene | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | |
| Dibenz(a,h)anthracene | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | |
| Fluoranthene | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | |
| Fluorene | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | |
| Indeno(1,2,3-cd)pyrene | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | |
| Naphthalene | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | |
| Phenanthrene | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | |
| Pyrene | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | |
| 1-Methylnaphthalene | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | |
| 2-Methylnaphthalene | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | |
| BEQs | | | | | | | | | | | | | | | | | | | |
| Benzo(a)Anthracene | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | |
| Chrysene | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | |
| Benzo(b)Fluoranthene | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | |
| Benzo(k)Fluoranthene | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | |
| Benzo(a)Pyrene | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | |
| Indeno(1,2,3-c,d)pyrene | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | |
| Dibenz(a,h)anthracene | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | |
| Total | 500 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | |
| Metals (mg/kg) | | | | | | | | | | | | | | | | | | | |
| Arsenic | 17.4 | 2.0 | 9.4 | 5.8 | 100 | 8.2 | 21 | 16 | 480 | 46 | 110 | -- | -- | 60 | 17 | 30 | 24 | 5.7 | 10 |
| Chlorinated Pesticides (ug/kg) | | | | | | | | | | | | | | | | | | | |
| Dieldrin | 300 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 32 B | 32 B | -- | -- | -- | -- | -- | |

Notes:

Soil concentrations exceeding regulatory guidelines are **BOLD**

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-- = Not Analyzed

mg/kg = milligrams per kilogram

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^a First Duplicate sample numbered 15SS150-S-02

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Table 1
Surface Soil Analytical Results
Site 15, NAS Pensacola

| Compounds | Regulatory Guidance Surface Soil (3x 95% UCL) | 15SS326 (0-2') | 15SS327 (0-2') | 15SS328 (0-2') | 15SS329 (0-2') | 15SS330 (0-2') | 15SS331 (0-2') | 15SS332 (0-2') | 15SS333 (0-2') | 15SS334 (0-2') | 15SS335 (0-2') | 15SS336 (0-2') | 15SS340 (0-2') | 15SS341 (0-2') | 15SS342 (0-2') | 15SS343 (0-2') | 15SS344 (0-2') | 15SS346 (0-2') | 15SS348 (0-2') |
|---------------------------------------|---|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|
| PAHs (ug/kg) | | | | | | | | | | | | | | | | | | | |
| Acenaphthene | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | |
| Acenaphthylene | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | |
| Anthracene | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | |
| Benzo(a)anthracene | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | |
| Benzo(a)pyrene | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | |
| Benzo(b)flouranthene | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | |
| Benzo(g,h,i)perylene | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | |
| Benzo(k)fluoranthene | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | |
| Chrysene | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | |
| Dibenz(a,h)anthracene | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | |
| Fluoranthene | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | |
| Fluorene | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | |
| Indeno(1,2,3-cd)pyrene | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | |
| Naphthalene | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | |
| Phenanthrene | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | |
| Pyrene | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | |
| 1-Methylnaphthalene | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | |
| 2-Methylnaphthalene | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | |
| BEQs | | | | | | | | | | | | | | | | | | | |
| Benzo(a)Anthracene | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | |
| Chrysene | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | |
| Benzo(b)Fluoranthene | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | |
| Benzo(k)Fluoranthene | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | |
| Benzo(a)Pyrene | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | |
| Indeno(1,2,3-c,d)pyrene | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | |
| Dibenz(a,h)anthracene | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | |
| Total | 500 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | |
| Metals (mg/kg) | | | | | | | | | | | | | | | | | | | |
| Arsenic | 17.4 | 25 | 17 | 4.8 | 5.4 | 42 | 31 | 41 | 28 | 8.9 | 32 | 31 | 5.8 | 40 | 4.8 | 7.1 | 3.7 | 11 | 7.8 |
| Chlorinated Pesticides (ug/kg) | | | | | | | | | | | | | | | | | | | |
| Dieldrin | 300 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | |

Notes:

Soil concentrations exceeding regulatory guidelines are **BOLD**

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mg/kg = milligrams per kilogram

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Table 2
Subsurface Soil Analytical Results
Site 15, NAS Pensacola

| Compounds | Regulatory Guidance Subsurface Soil (per the ROD) | 15SO70 (2-3') | 15SO75 (2-3') | 15SO146 Dupe of 15SO75 (2-3') | 15SO80 (2-3') | 15SO85 (2-3') | 15SO90 (2-3') | 15SO95 (2-3') | 15SO103 (2-3') | 15SO104 (2-3') | 15SO112 (2-3') | 15SO151 ^a Dupe of 15SO112 (2-3') | 15SO113 (2-3') | 15SO115 (2-3') | 15SO115 SPLP (3-4') | 15SO115 SPLP (7-8') | 15SO119 (2-3') | 15SO123 (2-3') | 15SO149 Dupe of 15SO123 (2-3') | |
|---------------------------------------|---|---------------|---------------|-------------------------------|---------------|---------------|---------------|---------------|----------------|----------------|----------------|---|----------------|----------------|---------------------|---------------------|----------------|----------------|--------------------------------|------|
| PAHs (ug/kg) | | | | | | | | | | | | | | | | | | | | |
| Acenaphthene | | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | |
| Acenaphthylene | | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | |
| Anthracene | | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | |
| Benzo(a)anthracene | | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | |
| Benzo(a)pyrene | | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | |
| Benzo(b)flouranthene | | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | |
| Benzo(g,h,i)perylene | | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | |
| Benzo(k)fluoranthene | | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | |
| Chrysene | | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | |
| Dibenz(a,h)anthracene | | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | |
| Fluoranthene | | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | |
| Fluorene | | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | |
| Indeno(1,2,3-cd)pyrene | | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | |
| Naphthalene | | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | |
| Phenanthrene | | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | |
| Pyrene | | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | |
| 1-Methylnaphthalene | | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | |
| 2-Methylnaphthalene | | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | |
| BEQs | | | | | | | | | | | | | | | | | | | | |
| Benzo(a)Anthracene | | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | |
| Chrysene | | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | |
| Benzo(b)Fluoranthene | | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | |
| Benzo(k)Fluoranthene | | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | |
| Benzo(a)Pyrene | | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | |
| Indeno(1,2,3-c,d)pyrene | | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | |
| Dibenz(a,h)anthracene | | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | |
| Total | 8000 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | |
| Metals (mg/kg) | | | | | | | | | | | | | | | | | | | | |
| Arsenic | 29 | 0.45 B | 0.69 | 0.71 | 0.79 | 1.6 | 3.2 | 3.0 | 2.2 | 25 | 1.2 | 1.4 | 0.75 | 19 | -- | -- | -- | 4.0 | 1.5 | 1.6 |
| Chlorinated Pesticides (ug/kg) | | | | | | | | | | | | | | | | | | | | |
| Dieldrin | 4 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 3.6 | 3.7 | 1.8 U | 33 | 8.7 B | .08 J | 4.8 | 0.12 |
| | | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 4.1 | -- | -- | |

Notes:

Soil concentrations exceeding regulatory guidelines are **BOLD**.

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-- = Not Analyzed

mg/kg = milligrams per kilogram

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J = estimated value

D = Sample was diluted prior to being analyzed

U = Undetected

^a First Duplicate sample numbered 15SS151-S-02

^b Second Duplicate sample numbered 15SS151-S-02

Table 2
Subsurface Soil Analytical Results
Site 15, NAS Pensacola

| Compounds | Regulatory Guidance Subsurface Soil (per the ROD) | 15SO126 (2-3') | 15SO129 (2-3') | 15SO151 ^b Dupe of 15SO129 (2-3') | 15SO135 (2-3') | 15SO136 (2-3') | 15SO141 (2-3') | 15SO240 (3-4') | 15SO240 (7-8') | 15SO240 (9-10') | 15SO278 (2-3') | 15SO284 Dupe of 15SO278 (2-3') | 15SO279 (2-3') | 15SO280 (2-3') | 15SO281 (2-3') |
|---------------------------------------|---|----------------|----------------|---|----------------|----------------|----------------|----------------|----------------|-----------------|----------------|--------------------------------|----------------|----------------|----------------|
| PAHs (ug/kg) | | | | | | | | | | | | | | | |
| Acenaphthene | -- | -- | -- | -- | 79 | 16 | 52 | -- | -- | -- | -- | -- | -- | -- | -- |
| Acenaphthylene | -- | -- | -- | -- | 11 U | 11 U | 10 U | -- | -- | -- | -- | -- | -- | -- | -- |
| Anthracene | -- | -- | -- | -- | 11 U | 11 U | 10 U | -- | -- | -- | -- | -- | -- | -- | -- |
| Benzo(a)anthracene | -- | -- | -- | -- | 10 J | 11 U | 13 | -- | -- | -- | -- | -- | -- | -- | -- |
| Benzo(a)pyrene | -- | -- | -- | -- | 43 J | 28 J | 48 | -- | -- | -- | -- | -- | -- | -- | -- |
| Benzo(b)flouranthene | -- | -- | -- | -- | 20 J | 7 J | 27 J | -- | -- | -- | -- | -- | -- | -- | -- |
| Benzo(g,h,i)perylene | -- | -- | -- | -- | 21 J | 7.2 J | 24 J | -- | -- | -- | -- | -- | -- | -- | -- |
| Benzo(k)fluoranthene | -- | -- | -- | -- | 9.4 J | 11 U | 13 J | -- | -- | -- | -- | -- | -- | -- | -- |
| Chrysene | -- | -- | -- | -- | 51 J | 11 U | 27 J | -- | -- | -- | -- | -- | -- | -- | -- |
| Dibenz(a,h)anthracene | -- | -- | -- | -- | 8.5 J | 11 U | 9.2 J | -- | -- | -- | -- | -- | -- | -- | -- |
| Fluoranthene | -- | -- | -- | -- | 50 J | 57 | 28 J | -- | -- | -- | -- | -- | -- | -- | -- |
| Fluorene | -- | -- | -- | -- | 11 U | 11 U | 10 U | -- | -- | -- | -- | -- | -- | -- | -- |
| Indeno(1,2,3-cd)pyrene | -- | -- | -- | -- | 17 J | 5.3 J | 21 J | -- | -- | -- | -- | -- | -- | -- | -- |
| Naphthalene | -- | -- | -- | -- | 11 U | 11 U | 10 U | -- | -- | -- | -- | -- | -- | -- | -- |
| Phenanthrene | -- | -- | -- | -- | 7.8 J | 11 U | 7 J | -- | -- | -- | -- | -- | -- | -- | -- |
| Pyrene | -- | -- | -- | -- | 22 | 4.9 J | 20 | -- | -- | -- | -- | -- | -- | -- | -- |
| 1-Methylnaphthalene | -- | -- | -- | -- | 11 U | 11 U | 10 U | -- | -- | -- | -- | -- | -- | -- | -- |
| 2-Methylnaphthalene | -- | -- | -- | -- | 11 J | 4.1 J | 18 J | -- | -- | -- | -- | -- | -- | -- | -- |
| BEQs | | | | | | | | | | | | | | | |
| Benzo(a)Anthracene | -- | -- | -- | -- | 1 J | 0.55 U | 1.3 | -- | -- | -- | -- | -- | -- | -- | -- |
| Chrysene | -- | -- | -- | -- | 0.051 J | 0.0055 U | 0.027 J | -- | -- | -- | -- | -- | -- | -- | -- |
| Benzo(b)Fluoranthene | -- | -- | -- | -- | 2 J | 0.7 J | 2.7 J | -- | -- | -- | -- | -- | -- | -- | -- |
| Benzo(k)Fluoranthene | -- | -- | -- | -- | 0.094 J | 0.055 U | 0.13 J | -- | -- | -- | -- | -- | -- | -- | -- |
| Benzo(a)Pyrene | -- | -- | -- | -- | 43 J | 28 J | 48 | -- | -- | -- | -- | -- | -- | -- | -- |
| Indeno(1,2,3-c,d)pyrene | -- | -- | -- | -- | 1.7 J | 0.53 J | 2.1 J | -- | -- | -- | -- | -- | -- | -- | -- |
| Dibenz(a,h)anthracene | -- | -- | -- | -- | 8.5 J | 5.5 U | 9.2 J | -- | -- | -- | -- | -- | -- | -- | -- |
| Total | 8000 | -- | -- | -- | 56.3 | 35.3 | 63.5 | -- | -- | -- | -- | -- | -- | -- | -- |
| Metals (mg/kg) | | | | | | | | | | | | | | | |
| Arsenic | 29 | 2.7 | 0.77 | 0.62 | 11 | 28 | 2.6 | -- | -- | -- | -- | -- | -- | -- | -- |
| Chlorinated Pesticides (ug/kg) | | | | | | | | | | | | | | | |
| Dieldrin | 4 | -- | -- | -- | -- | -- | -- | -- | 2.9 B | 1.8 U | 2.0 U | 1.7 U | 1.7 U | 5.0 | 1.8 U |
| | | | | | | | | | | | | | | | 0.5 J |

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Soil concentrations exceeding regulatory guidelines are **BOLD**

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-- = Not Analyzed

mg/kg = milligrams per kilogram

ug/kg = micrograms per kilogram

J = estimated value

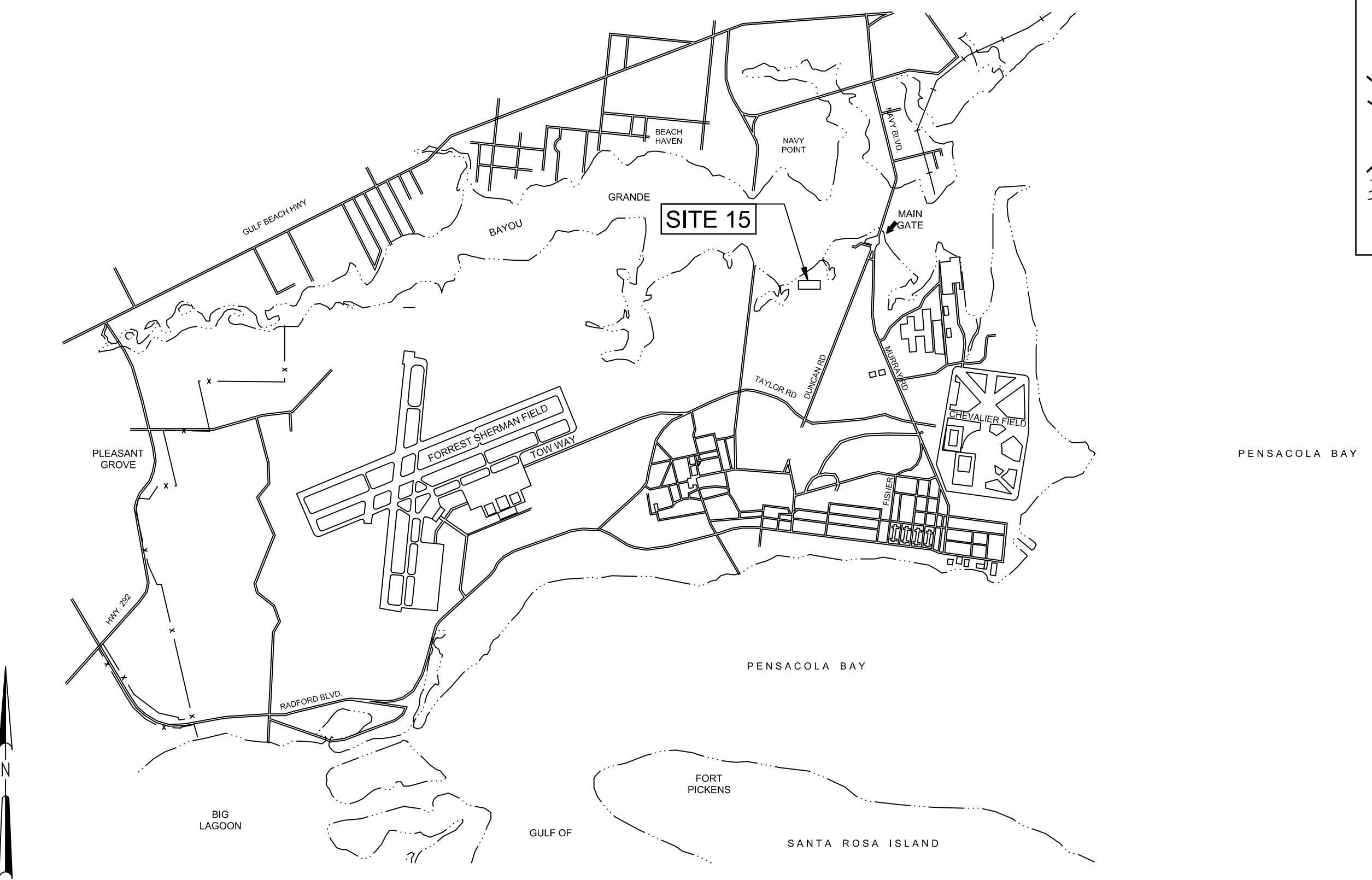
D = Sample was diluted prior to being analyzed

U = Undetected

^a First Duplicate sample numbered 15SS151-S-02

^b Second Duplicate sample numbered 15SS151-S-02

Figures



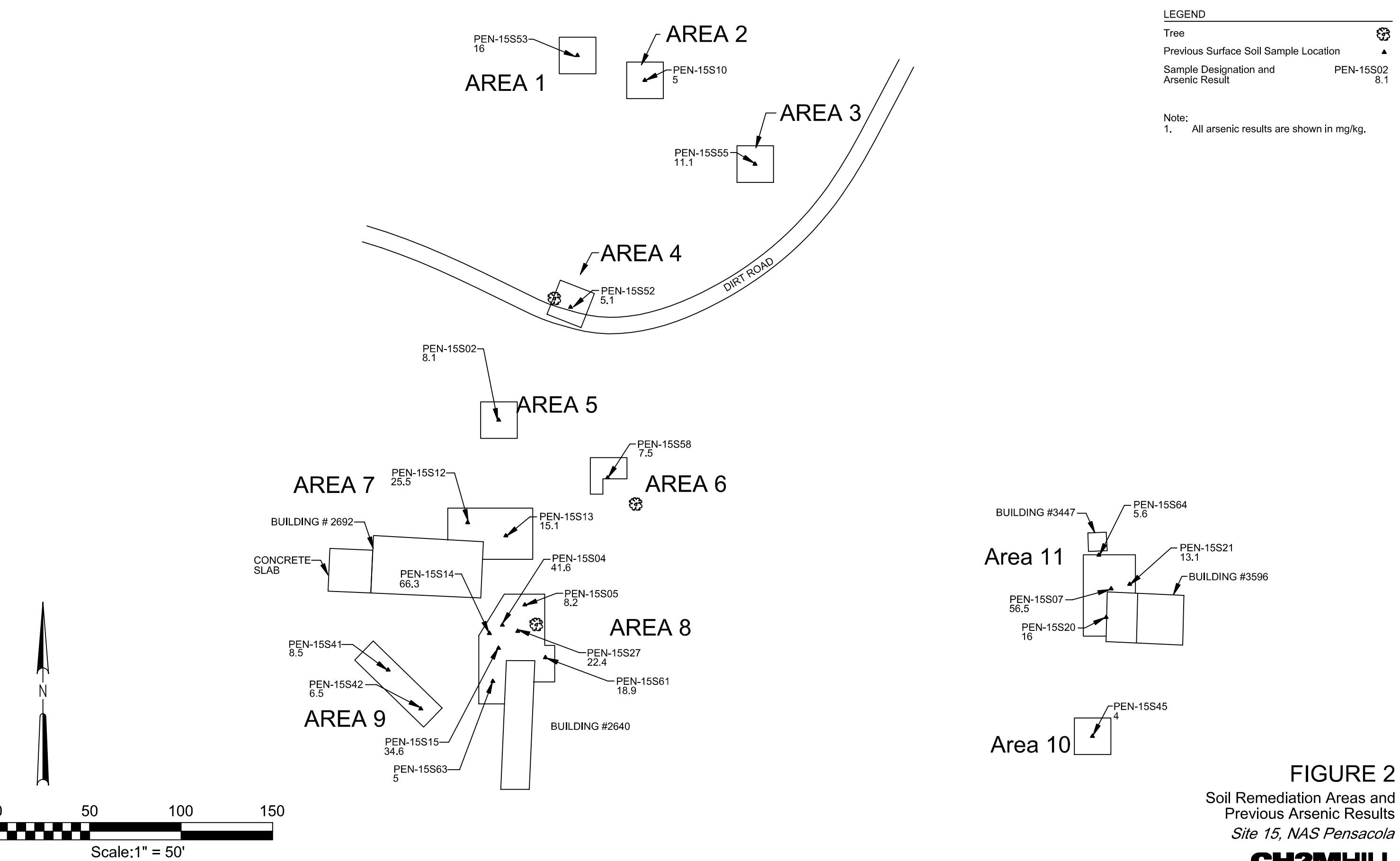
0 3000 6000 9000
 Approximate Scale: 1" = 3000'

FIGURE 1

Site Location Map

Site 15, NAS Pensacola

CH2MHILL



LEGEND

| | |
|--|-----------|
| Tree | ▲ |
| Previous Surface Soil Sample Location | ▲ |
| Surface Soil Sample Location | ● |
| Subsurface Soil Sample Location | ○ |
| Previous Surface Soil Sample Designation | PEN-15S53 |
| Surface Soil Sample Designation | 15SS71 |
| Subsurface Soil Sample Designation | 15SO75 |

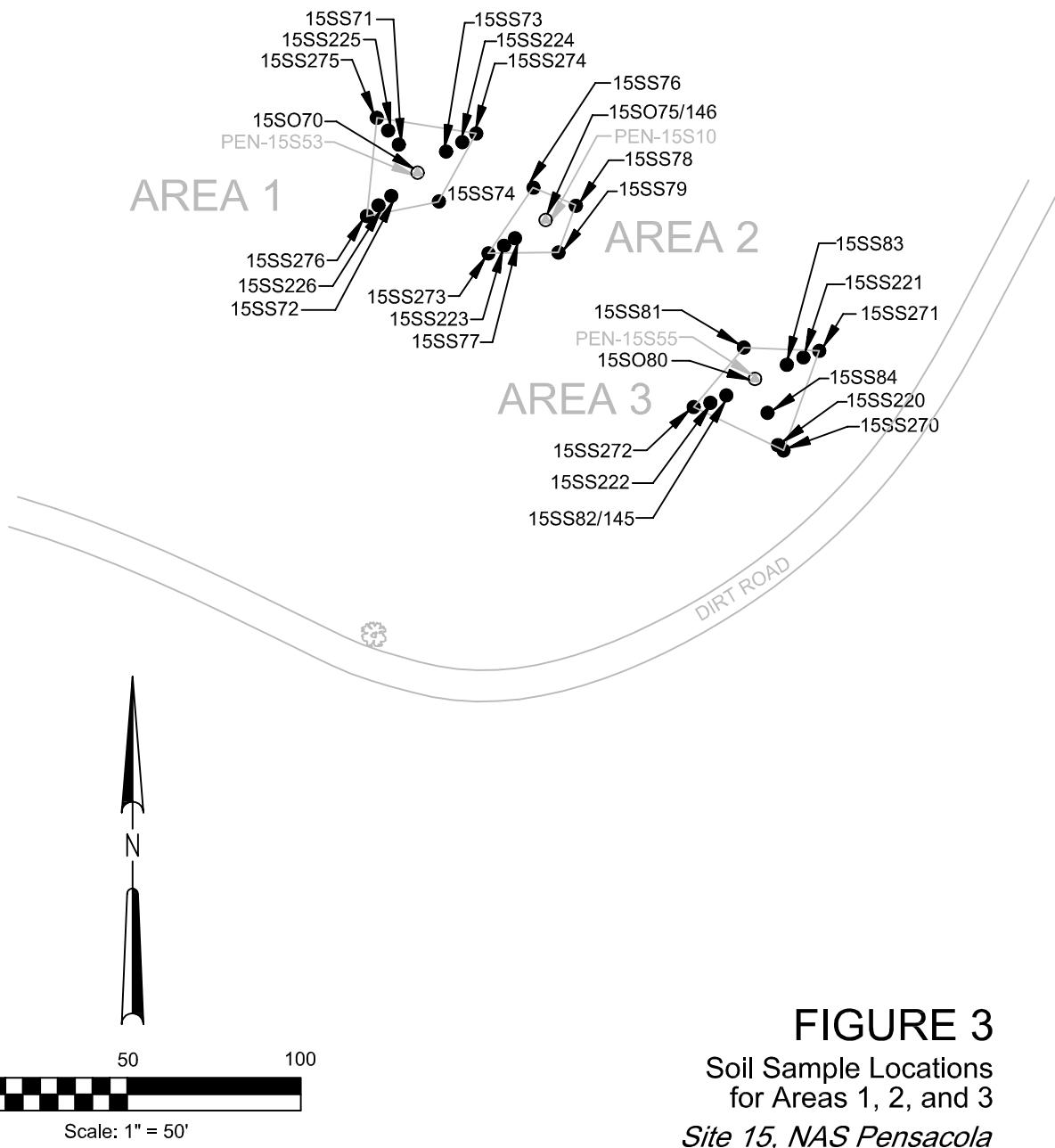


FIGURE 3
Soil Sample Locations
for Areas 1, 2, and 3
Site 15, NAS Pensacola

LEGEND

| | |
|--|-----------|
| Tree | ▲ |
| Previous Surface Soil Sample Location | ▲ |
| Surface Soil Sample Location | ● |
| Subsurface Soil Sample Location | ○ |
| Previous Surface Soil Sample Designation | PEN-15S52 |
| Surface Soil Sample Designation | 15SS86 |
| Subsurface Soil Sample Designation | 15SO85 |

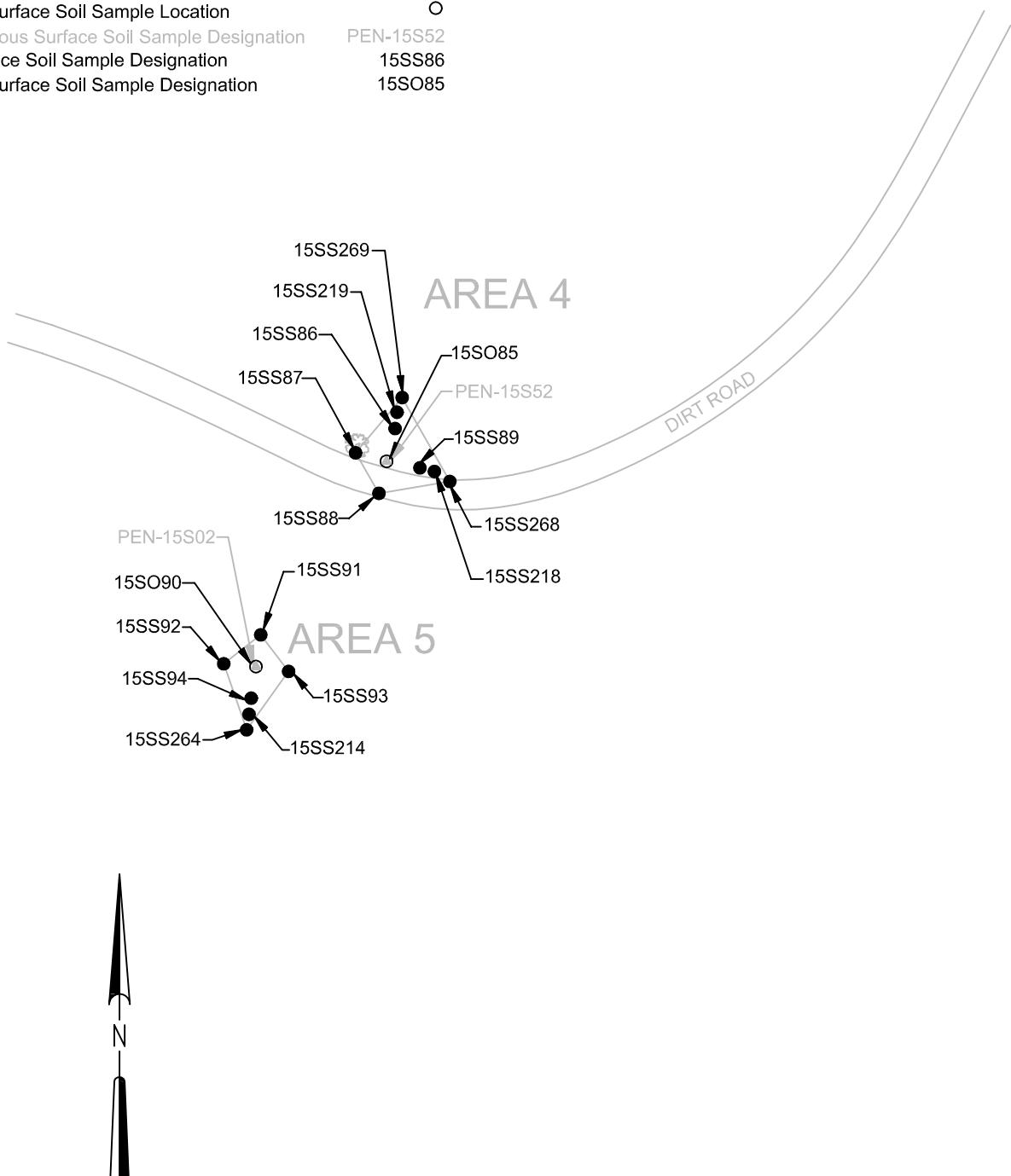


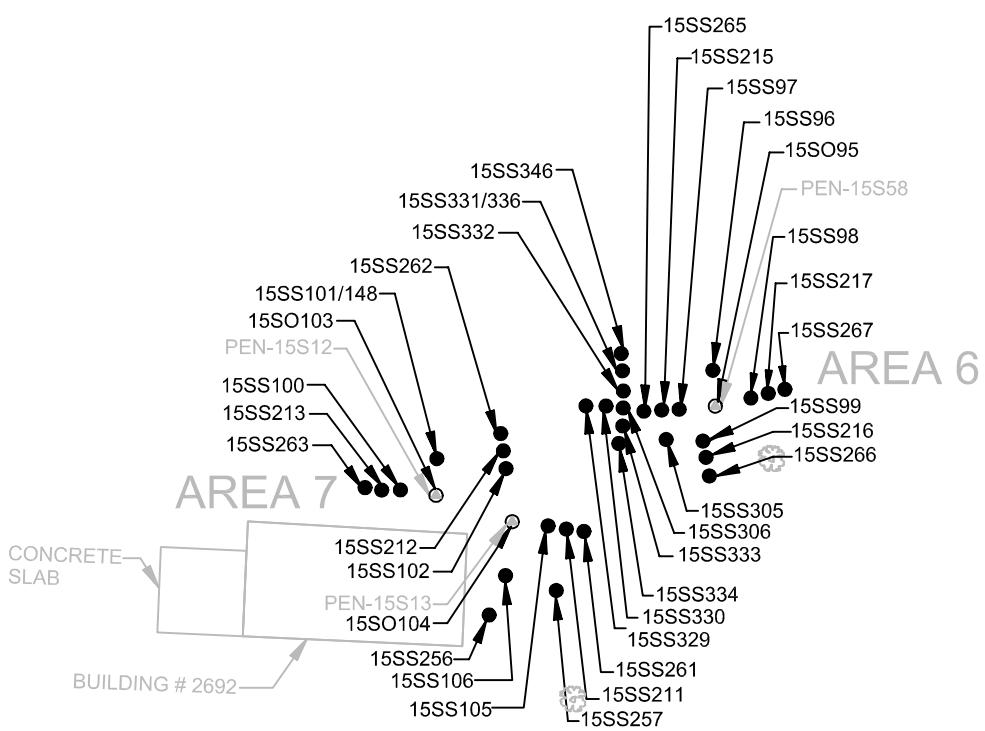
FIGURE 4
Soil Sample Locations
for Areas 4 and 5
Site 15, NAS Pensacola

0 50 100

Scale: 1" = 50'

LEGEND

| | |
|--|---|
| Tree |  |
| Previous Surface Soil Sample Location |  |
| Surface Soil Sample Location |  |
| Subsurface Soil Sample Location |  |
| Previous Surface Soil Sample Designation | PEN-15S13 |
| Surface Soil Sample Designation | 15SS100 |
| Subsurface Soil Sample Designation | 15SO103 |



A scale bar consisting of a black horizontal line with a white checkerboard pattern on its left side. Numerical markings are present at 0, 50, and 100. Below the bar, the text "Scale: 1" = 50'" is centered.

FIGURE 5

Soil Sample Locations for Areas 6 and 7

Site 15, NAS Pensacola

LEGEND

| | |
|--|-----------|
| Tree | |
| Previous Surface Soil Sample Location | |
| Surface Soil Sample Location | |
| Subsurface Soil Sample Location | |
| Previous Surface Soil Sample Designation | PEN-15S13 |
| Surface Soil Sample Designation | 15SS100 |
| Subsurface Soil Sample Designation | 15SO103 |

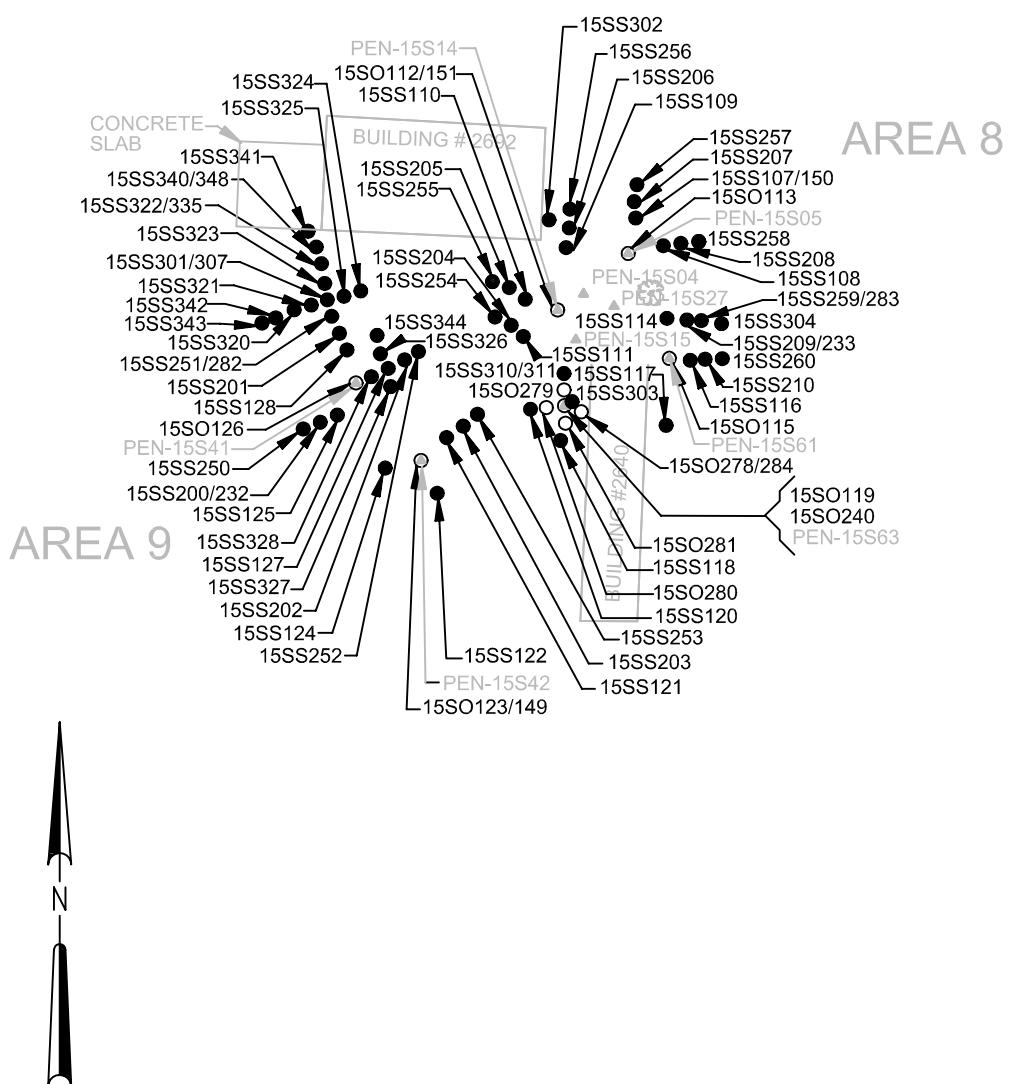


FIGURE 6
Soil Sample Locations
for Areas 8 and 9
Site 15, NAS Pensacola

0 50 100

Scale: 1" = 50'

LEGEND

| | |
|--|-----------|
| Tree | |
| Previous Surface Soil Sample Location | |
| Surface Soil Sample Location | |
| Subsurface Soil Sample Location | |
| Previous Surface Soil Sample Designation | PEN-15S64 |
| Surface Soil Sample Designation | 15SS229 |
| Subsurface Soil Sample Designation | 15SO141 |

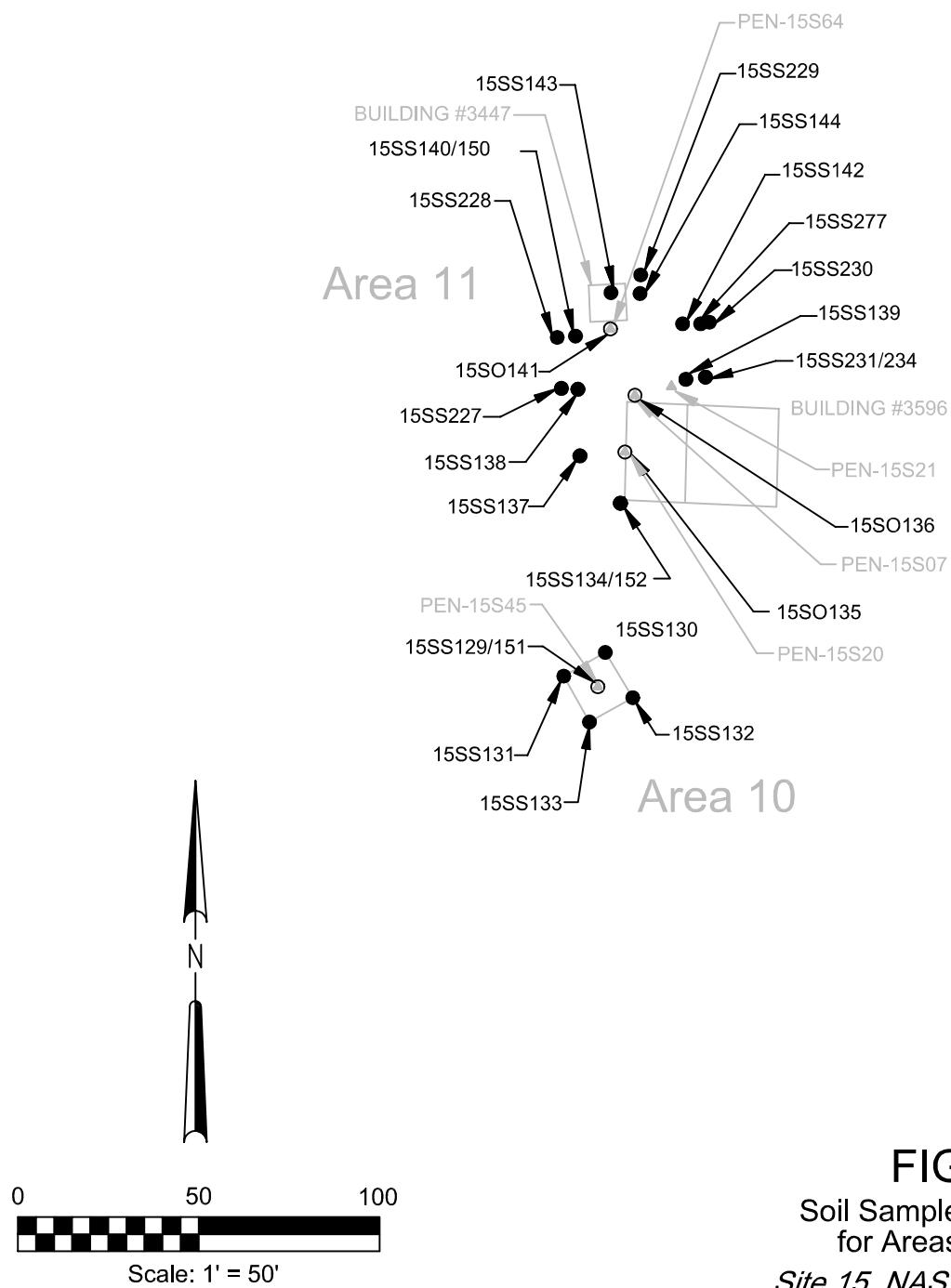


FIGURE 7
Soil Sample Locations
for Areas 10 and 11
Site 15, NAS Pensacola

LEGEND

| | |
|--|-----------|
| Tree | |
| Previous Surface Soil Sample Location | |
| Surface Soil Sample Location | |
| Subsurface Soil Sample Location | |
| Previous Surface Soil Sample Designation | PEN-15S13 |
| Surface Soil Sample Designation | 15SS100 |
| Subsurface Soil Sample Designation | 15SO103 |
| Proposed Excavation Area (0 - 2') | |

Notes:

1. The surface soil depths were measured at 0-2 feet.
2. The subsurface soil depths were measured at 2-3 feet.
3. All arsenic results are shown in mg/kg.
4. The applicable surface soil criterion for arsenic is 17.4 mg/kg.
5. The applicable subsurface soil criterion for arsenic is 29 mg/kg.
6. NE = No exceedance of applicable criteria

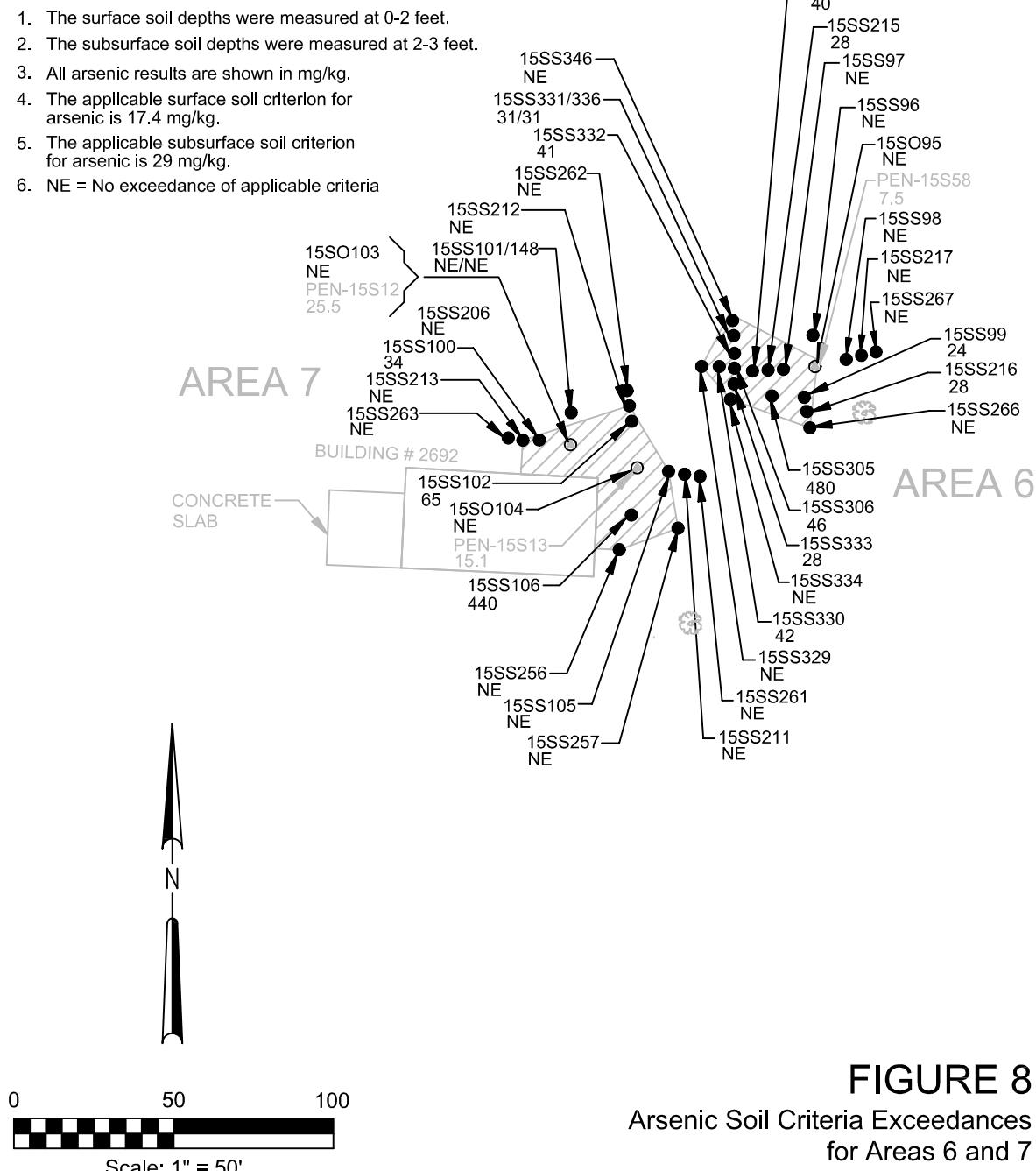


FIGURE 8
Arsenic Soil Criteria Exceedances
for Areas 6 and 7
Site 15, NAS Pensacola

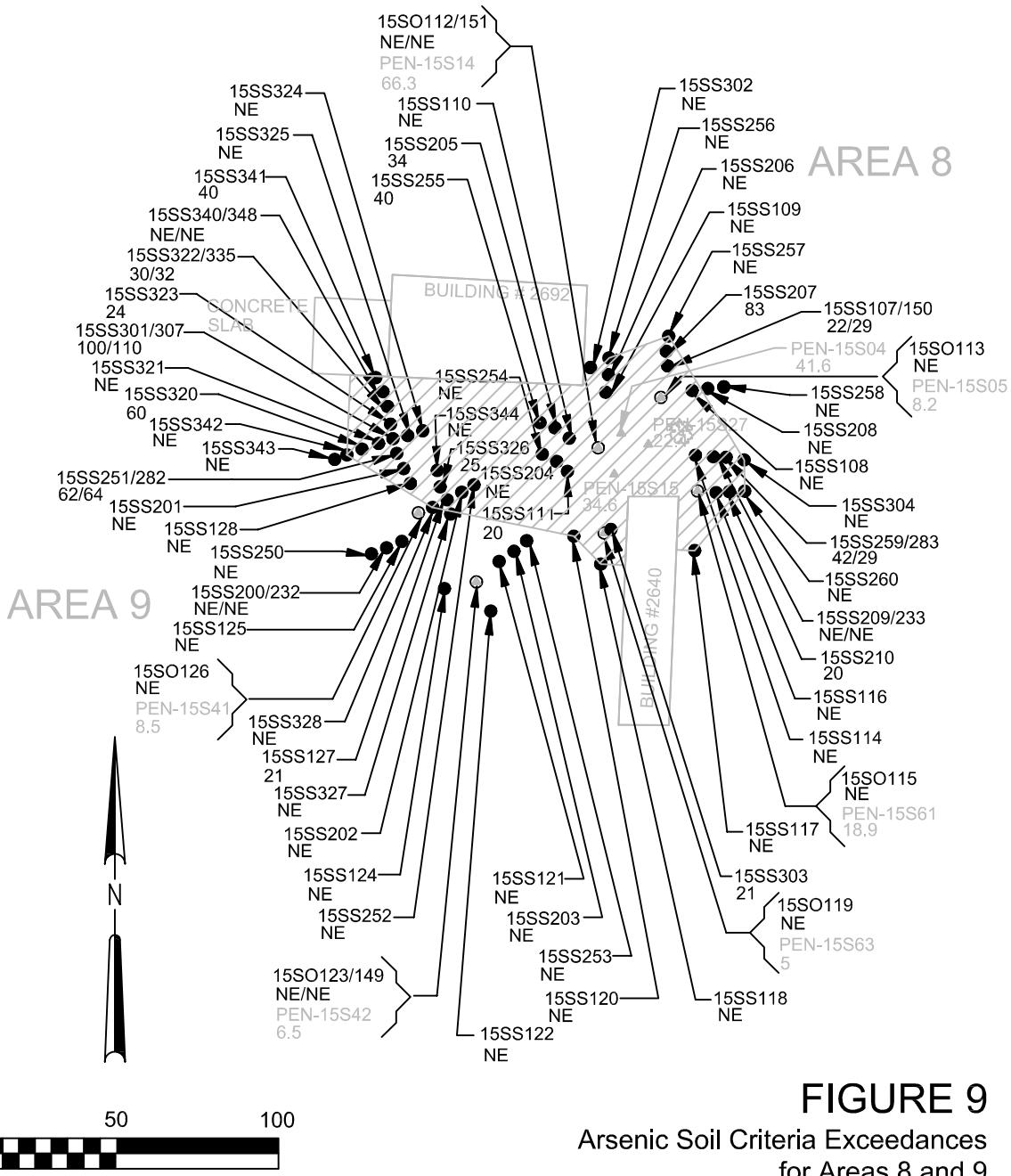
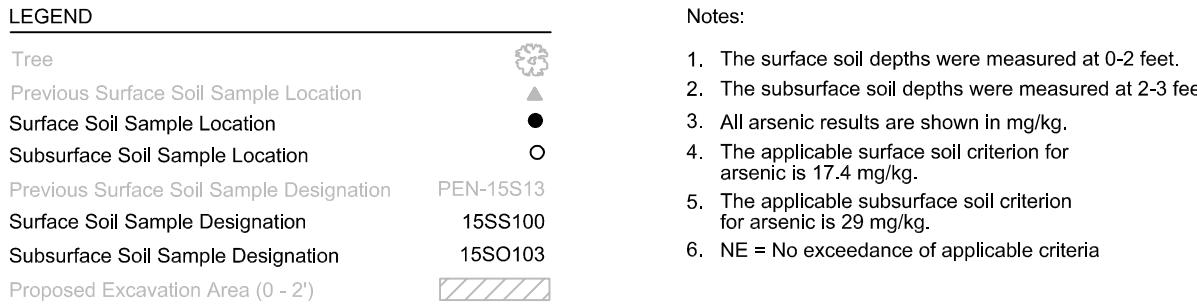


FIGURE 9
Arsenic Soil Criteria Exceedances
for Areas 8 and 9
Site 15, NAS Pensacola

LEGEND

| | |
|--|-----------|
| Tree | |
| Previous Surface Soil Sample Location | |
| Surface Soil Sample Location | |
| Subsurface Soil Sample Location | |
| Previous Surface Soil Sample Designation | PEN-15S13 |
| Surface Soil Sample Designation | 15SS100 |
| Subsurface Soil Sample Designation | 15SO103 |
| Proposed Excavation Area (0 - 2') | |

Notes:

1. The surface soil depths were measured at 0-2 feet.
2. The subsurface soil depths were measured at 2-3 feet.
3. All arsenic results are shown in mg/kg.
4. The applicable surface soil criterion for arsenic is 17.4 mg/kg.
5. The applicable subsurface soil criterion for arsenic is 29 mg/kg.
6. NE = No exceedance of applicable criteria

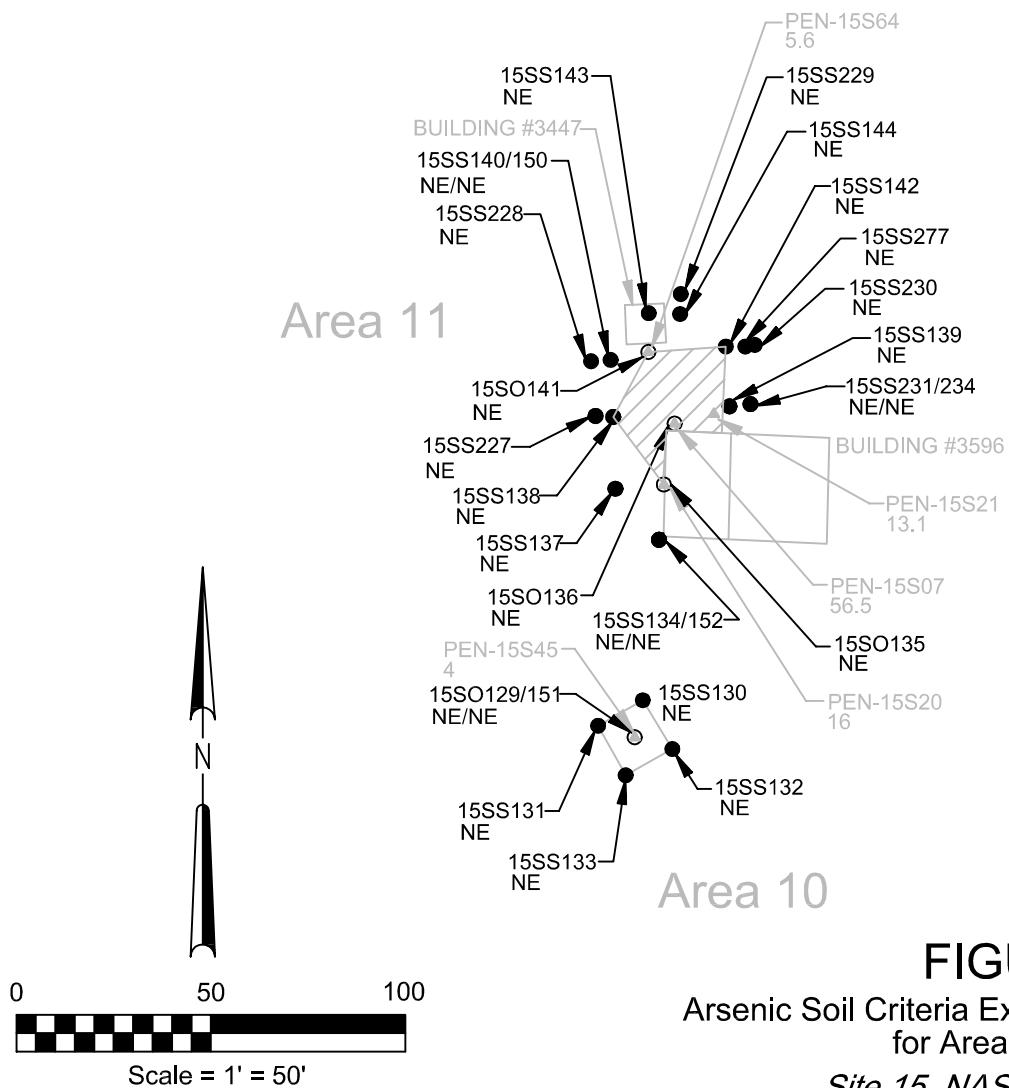


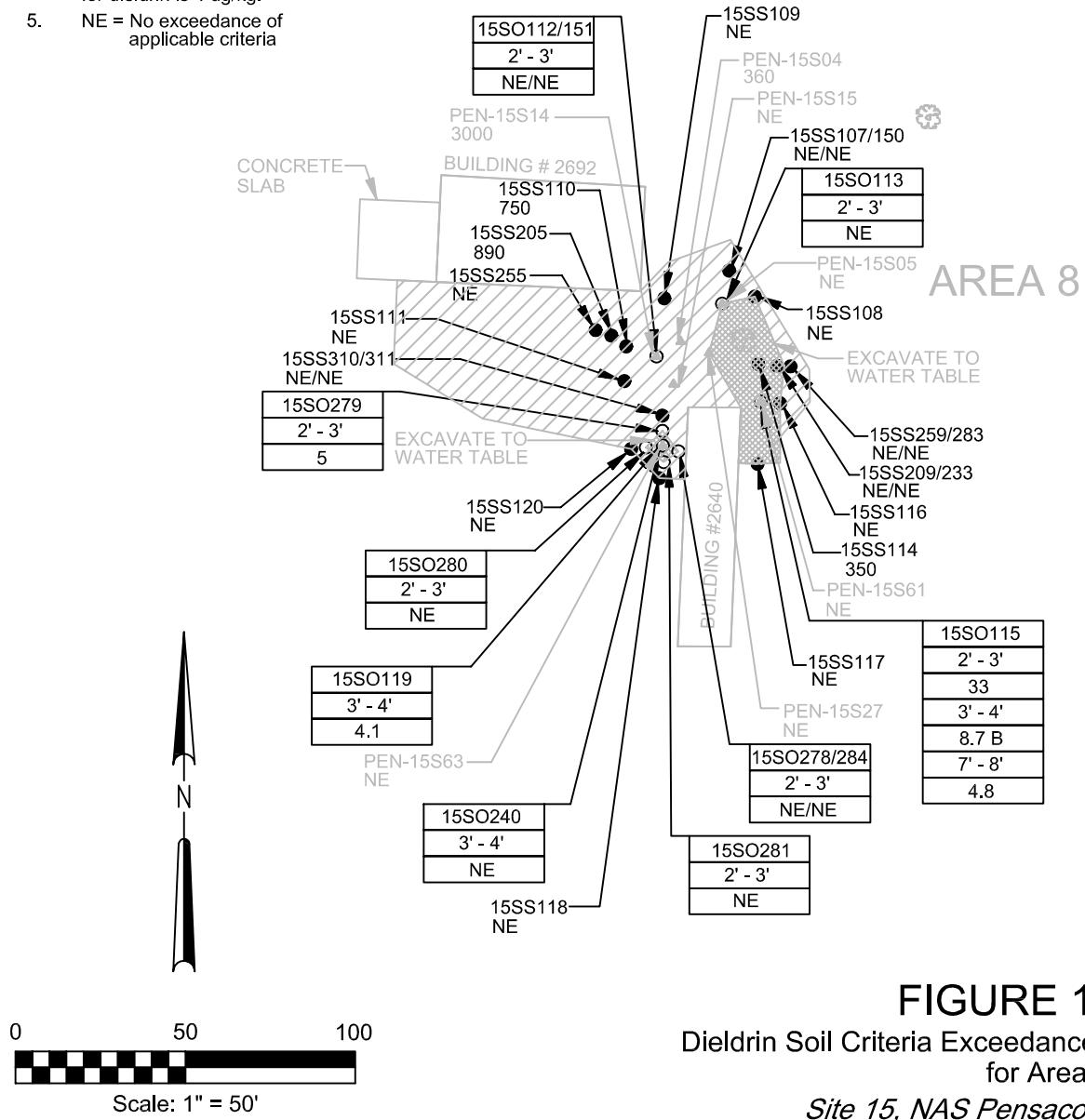
FIGURE 10
Arsenic Soil Criteria Exceedances
for Areas 10 and 11
Site 15, NAS Pensacola

LEGEND

| | |
|--|-----------|
| Tree | |
| Previous Surface Soil Sample Location | |
| Surface Soil Sample Location | |
| Subsurface Soil Sample Location | |
| Previous Surface Soil Sample Designation | PEN-15S13 |
| Surface Soil Sample Designation | 15SS100 |
| Subsurface Soil Sample Designation | 15SO103 |
| Proposed Excavation Area (0 - 2') | |

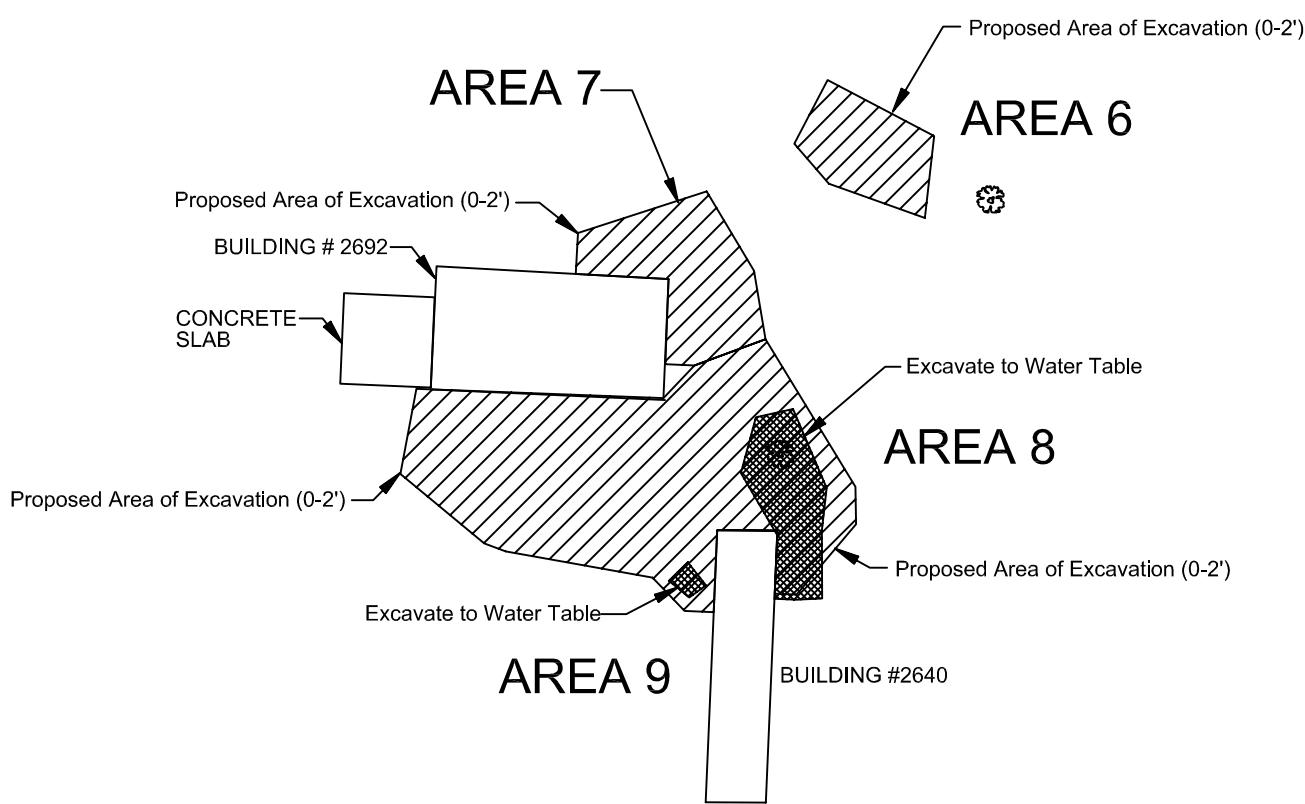
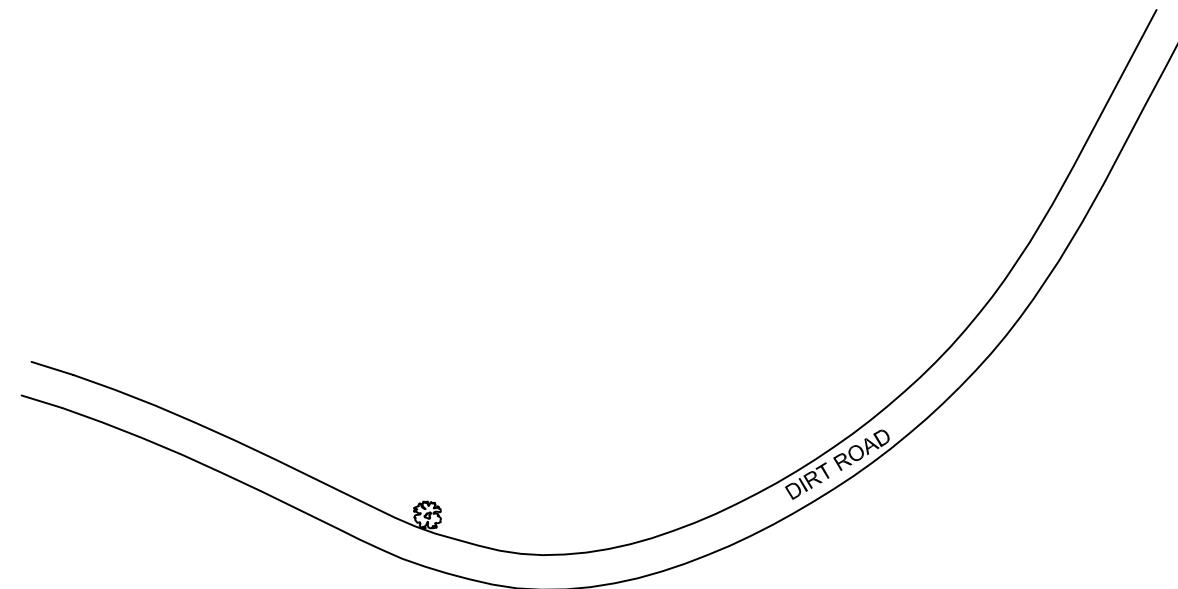
Notes:

1. All dieldrin results are shown in ug/kg.
2. All surface soil depths were measured at 0 - 2 feet.
3. The applicable surface soil criterion for dieldrin is 300 ug/kg.
4. The applicable subsurface soil criterion for dieldrin is 4 ug/kg.
5. NE = No exceedance of applicable criteria



LEGEND

Tree



0 50 100 150



Scale: 1" = 50'

FIGURE 12

Proposed Excavation Areas

Site 15, NAS Pensacola

CH2MHILL

Appendix A

Laboratory Analytical Reports

Appendix B

Data Quality Evaluation

Appendix C
FDEP Letter (April 2001)



Jeb Bush
Governor

Department of Environmental Protection

Twin Towers Building
2600 Blair Stone Road
Tallahassee, Florida 32399-2400

David B. Struhs
Secretary

April 11, 2001

Mr. James Holland
NAS Whiting Field
7151 USS Wasp Street
Milton, Florida 32570-6159

file: arsenic2.doc

RE: Analysis of Soil for Arsenic at Outlying Landing Fields

Dear Mr. Holland:

I have reviewed the above document dated April 3, 2001 (received April 9, 2001). The document describes soil sampling locations and analytical results for arsenic at four outlying landing fields associated with, but not adjacent to, NAS Whiting Field. Those facilities are Pace Field, Spencer Field, Santa Rosa Field and Harold Field. There are no known contaminated sites at those fields. Utilizing the information furnished in the document and in comparison with similar data from NAS Whiting Field, the Navy has requested a determination that arsenic levels observed at NAS Whiting Field are comparable with those seen at the outlying landing fields and that they are in naturally occurring concentrations.

Based on my review of those data, I have concluded that arsenic levels observed in soils at NAS Whiting Field are within the range of concentrations observed at the outlying fields and that they therefore are in naturally occurring concentrations. This determination may be applied only to arsenic in the soil for sites at NAS Whiting Field for which sufficient data presently exist. Please be aware that this finding does not preclude a future determination of a release of arsenic at any particular site if information and data warrant that conclusion.

If you have questions or need further clarification please contact me at (850) 921-4230.

Sincerely,

James H. Cason, P.G.
Remedial Project Manager

cc: Mollie Palmer, Office of the Secretary
Linda Martin, Southern Division, North Charleston
Amy Twitty, CH2M Hill, Navarre

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